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PULSE COUNTER,(U)
NOV 81 Y G DOBLEVICH, L A DUBITSKIY
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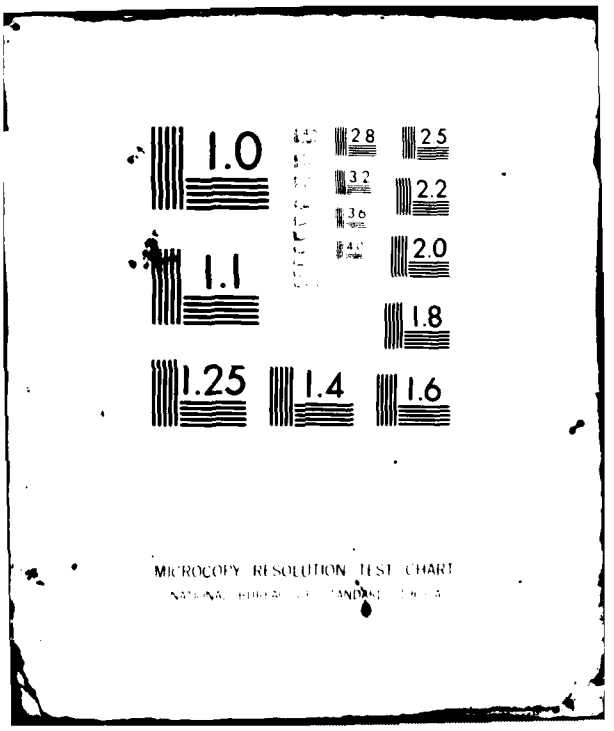
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MICROCOPY RESOLUTION TEST CHART

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FOREIGN TECHNOLOGY DIVISION

PULSE COUNTER

by

Ya. G. Doblevich, L. A. Dubitskiy, et al.

EDITED TRANSLATION

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U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ё in Russian, transliterate as yë or ë.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	$\sinh^{-1}$
cos	cos	ch	cosh	arc ch	$\cosh^{-1}$
tg	tan	th	tanh	arc th	$\tanh^{-1}$
ctg	cot	cth	coth	arc cth	$\coth^{-1}$
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

A

PULSE COUNTER

Ya.G. Doblevich, L.A. Dubitskiy, Yu.I. Kuz'min, Ya.I. Pilyavskiy, and Yu.M. Sikorskiy

The invention refers to computer technology, is designed for use in the counting of pulses and division of pulse repetition frequency, and can be used, in particular, in electronic counting frequency meters.

Known are pulse counters of the storage-element type, which contain an input amplifier-limiter the output of which through the series connected dosing condenser and diode is connected with the base of the linearizing transistor, and the storage-element condenser is connected through a comparator to a discharge device.

The proposed counter differs from the known counters in that it contains two opposing series connected diodes between the output of the amplifier-limiter and connection point of the storage-element condenser with the comparator, and the common point of the diodes is connected with the collector of the linearizing transistor, the emitter of which is connected through a resistor to the connecting point of the dosing condenser with the diode and the base, to the power supply bus.

This makes it possible to increase the reliability of operation of the counter in a wide range of input frequencies (from low frequencies up to the resolution reset stage of the counter) and temperatures of the environment.

The essence of the invention consists in the division of circuits of the charge of the storage capacitance and circuits which short the reverse current of the linearizing transistor.

The proposed pulse counter is shown on the drawing.

The counter contains an input amplifier-limiter 1, to the output 2 of which is connected one output dosing condenser 3, the second output of which through resistor 4 is connected with the emitter of the linearizing transistor 5. The collector of the transistor 5 is connected through the diode 6 with output 2 of the input amplifier--limiter 1 and with the storage-element condenser 8 through diode 7. The base of the transistor 5 is connected to the voltage source and through diode 9 to the connecting point of the dosing condenser 3 and resistor 4. The storage-element condenser is connected with the input of the discharge device 11 through the comparator 10.

The pulse counter operates in the following manner.

In the initial state the storage condenser [charging capacitor, reservoir capacitor] 8 is discharged to zero, and the dosing condenser 3 is charged to the voltage of the power supply -E, the amplifier-limiter 1 is cutoff, and at its output 2 the potential is approximately equal to zero. Transistor 5 is also cutoff, since the potentials of its base and emitter are equal.

With the entering of the first counting pulse into the input of the amplifier-limiter 1, the latter is opened up to saturation, and at its output 2 the potential becomes approximately equal to -E. As a result of this, transistor 5 is cutoff, and the dosing condenser 3 begins to be discharged along the circuit: output 2 of amplifier--limiter 1 - resistor 4 - junction emitter-collector of transistor 5 - diode 7 - capacitor 8.

Capacitor 8 is charged in the process of the discharge of capacitor 3, since practically the whole current of discharge of capacitor 3 flows through the collector junction of transistor 5 and is shorted through capacitor 8 to ground.

In the process of the recharging of capacitors 3 and 8, diode 7 proves to be opened, and diode 6 closed, since a more negative potential is applied to its anode than to its cathode.

Upon completion of the action of the input counting pulse, the input amplifier-limiter is cutoff, and at its output the potential becomes equal to zero. As a result, capacitor 3 is charged from the -E voltage over the circuit: -E voltage source - diode 9 - load resistor 12 of the input amplifier-limiter 1. Transistor 5 is cutoff, and, in connection with this, diode 7 is cutoff; and diode 6 is opened, and the load resistor 12 proves to be connected to the collector of the transistor 5.

Thus in the pause between the input counting pulses, the charging capacitor 8 is disconnected by diode 7 from the linearizing transistor, and reverse currents of the latter are shorted through the load resistor 12, not causing a significant voltage drop on this resistor in view of the small magnitude.

With the entering of the next counting pulses into the input of the counter, the process of the discharge of the dosing and charge of the charging capacitors is repeated, and the voltage on the storage capacitance is increased in steps. When the magnitude of this voltage reaches the magnitude of the comparison voltage, the comparator 10 is opened, and the discharge device 11 is actuated.

The counter is returned to its initial state.

Object of the Invention

The object of this invention is a pulse counter of the storage--element type, which contains an input amplifier-limiter the output of which is connected with the base of the linearizing transistor through the series connected dosing capacitor and diode, and a charging capacitor, which is connected to the discharge device through the comparator. This counter differs in that for the purpose of increasing the reliability of operation of the counter in a wide range of input frequencies and temperatures of the environment, it contains two opposing series connected diodes between the output of the amplifier-limiter and connecting point of the charging capacitor with the comparator; the common point of the diodes is connected with the collector of the linearizing transistor, the emitter of which, through the resistor, is connected to the connecting point of the dosing capacitor with the diode, and the base is connected to the power supply bus.

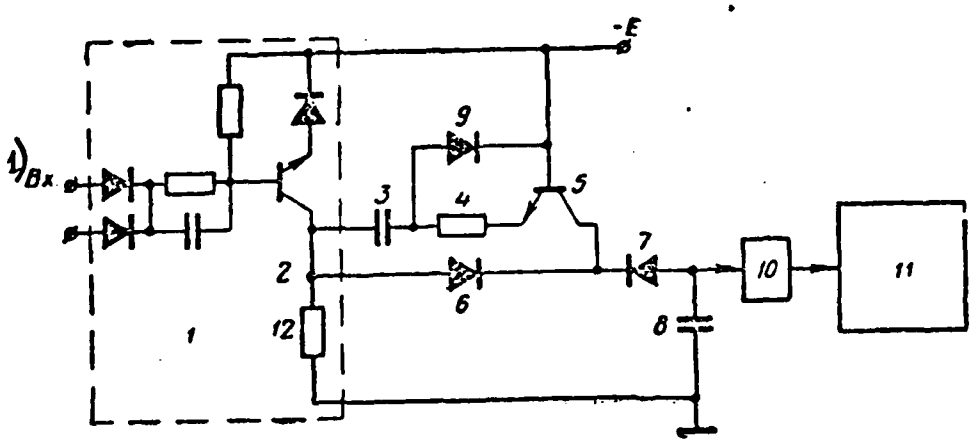

Figure. KEY: 1) Input.